of the nature of the new element comprise the discovery, in conjunction with Mme. Curie, of the so-called induced activity conferred by radium on surrounding objects, and the proof that the penetrating radiations transport negative electricity even after they have been made to pass through a sheet of metal connected to earth. In conjunction with M. Laborde he discovered and measured the spontaneous evolution of heat from radium compounds.

In 1903 the Davy medal was conferred by the Royal Society on M. and Mme. Curie, and they shared with M. Branly the Osiris prize, and with M. Becquerel the Nobel prize for physics. M. Curie was made a member of the Institute of France in 1905. He will be remembered in this country for the lecture on radium, delivered with characteristic modesty and simplicity of manner, at the Royal Institution in 1903. He refused the Cross of the Legion of Honour offered by the French Government, on the ground that he preferred to remain a simple citizen, holding no doubt the view that scientific discovery is its own sufficient reward.

It has been said by a recent writer that there will come a time when men will date the coming in of their kingdom to the day when Curie and Laborde discovered the spontaneous evolution of heat from radium. Certainly no limit can be set to the consequences in the near or distant future which may be expected to flow from the discoveries with which the name of Curie is associated.

Like Röntgen shortly before, Curie emerged at one step from comparative obscurity to universal fame, and what they achieved is still within the horizon of the humblest investigator. Like the soldiers of Napoleon, each of the rank and file of the army of patient investigators carries in his knapsack a marshal's baton. The career of M. Curie illustrates this, and continues as an inspiration and encouragement to others. None have set in motion more pregnant influences. No one stands in less need of the historian to perpetuate his memory. F. S.

NOTES.

In the disastrous earthquake at San Francisco, a detailed description of which is given in another part of the present issue, it is reported that upwards of 1000 persons lost their lives, and that material damage was done to the value of more than sixty million pounds sterling. There seems little reason to doubt that most of these lives and the greater part of the property were lost in the fire which followed the earthquake, and that a little forethought would have prevented, or at least greatly lessened, the awful calamity. Electric mains were broken by the earthquake shock at a time when the current was being supplied, and gas and water mains were shattered. The electric current does not appear to have been stopped at the power stations, and the consequent numerous short circuits which occurred soon inflamed escaping gas and set fire to buildings in many parts of the city. The broken water mains obliterated the water supply, and the only means of checking the fire seems to have been the demolition by dynamite of property in its path. The steel buildings in the city appear to be almost intact. The earthquake did not damage them, and the fire only consumed the woodwork. Despite the rumours which have been in circulation as to damage to universities and observatories in the disturbed area, it is gratifying to know that there is as yet no confirmation of such calamities. Upon inquiry at the Royal Astronomical Society, we learn that no news has been received about any of the Californian observatories. Astronomers are particularly anxious as to the fate of the Lick Observatory, situated as it is very near to the centre of disturbance, and in view of a rumour that has reached a London fire insurance company of serious injury to the observatory. The Solar Observatory at Mount Wilson—near Pasadena, which is ten miles N.N.E. of Los Angeles—is probably too far to the south to have been damaged.

Some changes in the organisation of the Geological Survey of Canada have recently been made by the Premier, Sir Wilfrid Laurier. For more than five years Dr. Robert Bell, F.R.S., has been the acting-director of the Survey, and has managed the business as well as the scientific affairs to the satisfaction of the scientific, mining, and the general public. In this period he has accomplished much valuable work, initiated many useful new features, and raised the standing of the Survey in general estimation. Since the Survey began, sixty-three years ago, about 470 maps have been prepared and issued, and nearly one-third of this number have been published during the past five years, while others are nearly ready. By the change of organisation which has just been instituted, a business administrator has been appointed, while Dr. Bell is given the title of Chief Geologist of the Dominion. Dr. Bell will continue to prepare his reports, maps, and other works, and will have a free hand in geological matters, so that he ought apparently to be congratulated on being relieved of a troublesome and difficult part of his work.

The bi-centenary of the birth of Benjamin Franklin was celebrated by the American Philosophical Society at Philadelphia on April 17–20, in accordance with the programme announced in Nature of March 29 (p. 515). Addresses were read from the universities of Oxford, Cambridge, Glasgow, and Edinburgh, the Paris Academy of Sciences, and many other institutions. A statue of Franklin, presented to the City of Paris by Mr. J. H. Harjes, was to have been dedicated on April 20 at an international festival, in which the French Government had arranged to take part, but the celebrations were postponed in consequence of the catastrophe at San Francisco.

Prof. W. Ostwald has been elected a foreign member of the Danish Academy of Sciences.

Prof. Gabriel Oltramare, who for fifty years held the chair of mathematics at Geneva University, died on April 10, in his ninetieth year.

The death is announced, at sixty-five years of age, of Dr. N. S. Shaler, professor of geology at Harvard University and dean of the Lawrence Scientific School.

The annual meeting of the South African Association for the Advancement of Science will be held at Kimberley on July 9–14, under the presidency of Mr. G. F. Williams.

Dr. Dudley Buxton has been elected chairman of the council of the Selborne Society for the ensuing year, during which the society will attain its majority, having been founded in 1885. The annual *soirée* will be held on May 25, when the president, Lord Avebury, will deliver an address.

A telegram from Sarajevo, Bosnia, states that at 11 a.m. on April 19 a short, sharp earthquake shock was felt there. The shock was undulatory in character, and travelled from west to east. An earthquake shock was felt at Grants Pass, Oregon, at 1.11 a.m. on April 23. The Wellington correspondent of the *Times* reports that both the Eastern

Company's cables between New Zealand and Australia suddenly broke on April 23, as the result, it is presumed, of submarine disturbances. A sharp earthquake shock was felt at San Francisco at 10.39 p.m. on the same date. It lasted about three seconds, and the motion was from east to west.

Dr. V. F. L. Matteucci, director of the Vesuvius Observatory, has issued the following reports:—*April* 18.—A very violent squall blew the plume of smoke which hung over Vesuvius on to the observatory, bearing with it a quantity of dust and asphyxiating gases. The crater, though shrouded in thick mist and rain, seems to be quiet. *April* 20.—The shower of ash has ceased and the cloud of dust has dispersed, leaving visible the crater, which continues to eject, though more calmly, globular masses of vapour containing lesser quantities of dust, which fall on the eastern slopes of the volcano. No further shocks have occurred, only very slight movements being reported by the more sensitive seismographs. *April* 23.—The seismic instruments are very steady. The crater is emitting grey vapour, together with small quantities of dust at intervals.

According to the *Chemiker Zeitung*, the number of patents applied for during 1905 in Germany was 30,085 as against 28,360 in 1904, whilst the number of patents fully taken out was 9600 against 9189. Of the different applications, 22,030 were by Germans, 1769 by Americans, 1410 by Frenchmen, 1264 by Englishmen, 873 from Austria, 707 from Switzerland, 473 from Belgium, 249 from Hungary, 246 from Russia, 230 from Denmark, 188 from Italy, 174 from Sweden, 48 from Norway, &c. The largest number of new patents for the year came under the heading of electrotechnics. During the year 8623 patents expired or for other reasons ceased to be worked, while at the end of the year 32,430 patents remained in force.

From Budapest we learn that the director of the Hungarian Chemical Agricultural Institute has presented a strong petition to the Government urging the complete reorganisation of the institute, which was opened twenty-five years ago by the Minister of Agriculture as a central experimental station for agricultural chemistry. In the first instance it is proposed that no further analyses for private persons be undertaken, as this is not only unfair to the private laboratories, but provides so much work for the institute as to hinder members of the staff from following up any line of scientific research. Great stress is laid upon the advisability of bringing all the experimental stations into intimate union with the Imperial Institute of Hungary. According to the director's proposal, the reorganised institute shall be divided into seven departments, each under the supervision of a head chemist.

The Easter party of naturalists and students at the Liverpool Marine Biology Committee's station at Port Erin, in the Isle of Man, has been larger than usual, and the available accommodation in both hatchery and laboratory has been fully occupied. In addition to senior students from the botanical and zoological departments of the universities of Manchester and Liverpool, the following professional workers have occupied tables in the laboratory:—Dr. H. E. Roaf (bio-chemistry), Mr. J. Pearson, Mr. W. Gunn and Prof. Herdman, and Mr. Chadwick, the curator of the biological station. In the sea-fish hatchery the season has been a good one. Although the first fertilised plaice eggs were obtained from the spawning pond on February 13, only one day earlier than last year, embryos in large numbers appeared comparatively early in the season, and the output of young fish is now about a million in advance of the corresponding date in 1905. Five and three-quarter million plaice eggs have now been obtained from the pond, and nearly three and a half million larvæ have been set free in the Irish Sea. The largest number put out on one day was 470,000, on April 20.

The latest report of the Decimal Association, of which Lord Kelvin is a vice-president, states that it is proposed to open a new Parliamentary campaign to prepare the way for the introduction of a Bill in the House of Commons, on the lines of the Bill which has already passed the House of Lords. The report goes on to point out that advocates of the metric system of weights and measures in the United States of America have been encouraged by the introduction of a Bill in the House of Representatives by Mr. Littauer, which provides for the exclusive use of metric weights and measures in all Government departments. This Bill, as has been recorded already in these columns, is now before a Standing Committee of the House of Representatives, and there is every hope that it may be reported on favourably. The executive committee of the association records in the report its thanks to the Association of Trade Protection Societies for its continued advocacy of the compulsory adoption of metric weights and measures. Since this association represents retail as well as wholesale traders, its support may be taken as a distinct refutation of the assertion that the shopkeepers of the country do not wish to see the adoption of the decimal system of measurement. The report mentions also that the Canadian Government has appointed as lecturer a professor of the University of Toronto to devote a year to the task of explaining the metric weights and measures in all the leading cities from Halifax to Vancouver.

Reports are being received of twilight glows and of the deposition of dust, supposed to be due to the recent eruption of Vesuvius. Prof. Stanislas Meunier has collected on the roof of his house in Paris dust said to be identical with the dust of the eruption of 1872. At Southall, Middlesex, Mr. G. Gibson has also collected dust apparently of similar nature. Dr. F. A. Bather, writing from Wimbledon, informs us that on the evening of April 18 the sunset was strongly reminiscent of the Krakatão glows. It will be interesting to learn whether similar observations have been recorded in other localities. The distribution of the dust would depend chiefly upon the upper air currents, which are usually different from those at the surface, and although the surface winds have recently been from north and north-east, the dust may have been carried to north-west Europe by currents in the upper air.

It is stated in the *Cologne Gazette* that the German Government is making preparations for the issue shortly of weather forecasts for agriculturists. The forecasts will be sent free or at a nominal charge, and the success of the undertaking will be judged from returns of the subsequent weather supplied by the recipients of the information. We think this is a step in the right direction; the experiment has already been made with much success in the United States and elsewhere. Prof. Willis Moore, *e.g.*, in an article in the *National Geographic Magazine* for June, 1905, says:—"No large grower of fruits or vegetables is content to be excluded from the receipt of the frost forecasts." During the hay and corn harvest (June–September) special forecasts have been, for many years, issued to farmers in this country by the Meteorological

Office. The only charge now made is for the actual cost of the telegrams, and the success of the work is judged, as proposed in the German scheme, by the returns made by the recipients themselves. From the last published annual report (1904–5) we see that the total and partial success of the forecasts amounted to 92 per cent. for the country generally, and that 58 per cent. were completely successful.

THE Bulletin of the Italian Meteorological Society is now issued in two-monthly parts, and includes original contributions and monthly results of observations at a considerable number of stations. The issue for February-March contains an interesting account of the ascents of two unmanned balloons in August last, near Treviso, Venice, in both of which readings were obtained at altitudes exceeding 10,000 metres. The first important inversion of temperature, amounting to 6° C., was experienced between 10,000 metres and 10,385 metres, on August 4, notwithstanding the fact that a few hours previously a very violent thunderstorm occurred at the station. The second ascent was made on August 30, at the time of the solar eclipse; the inversion of temperature was not so marked as in the previous case, but amounted to 3° C. between the heights of 18,000 metres and 20,000 metres. The exact altitude of the inversion during this ascent is somewhat uncertain, as the barometric trace was partially obliterated by the peasants who picked up the records. Thunderstorms were also prevalent about twelve hours prior to the time of this ascent. The discovery of such inversions of temperature is known to be one of the most interesting results connected with the recent explorations of the upper air.

To vol. xxvi., part iv., of Notes from the Leyden Museum, Dr. H. W. van der Weele contributes three papers on Malay Neuroptera, the most important of these dealing with the representatives of the family Sialidæ. Among other notes, Dr. J. G. de Man discusses and redescribes certain Malay crustaceans of the genus Palæmon, while Dr. R. Horst describes a parasitic copepod crustacean of the genus Penella infesting a large fish from the Moluccas.

A HAND-LIST of Philippine birds has been drawn up by Messrs. R. C. McGregor and D. C. Worcester, and published at Manila by the Bureau of Government Laboratories. A slip inserted within the cover announces that the publication of the Bulletins of the Bureau has been discontinued, and that in their place will be issued a new serial, the *Philippine Journal of Science*, while the Bureau itself becomes the Bureau of Science of the Philippine Islands.

THE January issue (vol. x., part i.) of the Transactions of the Leicester Literary and Philosophical Society contains a report of the president's address at the annual meeting in October last, in which attention is directed to the decadence of artistic feeling and good taste in the design and execution of architectural and kindred objects in and around Leicester. The contents include a paper by Mr. J. R. Plant on the geological history of molluscs, and a second, by Mr. H. Donisthorne, on Isle of Wight beetles.

NO. 1442 of the Proceedings of the U.S. National Museum is devoted to notices of the type specimens of Ordovician and Silurian Bryozoa collected and described by Mr. U. P. James. These fossils, which came from the Cincinnati group, are mostly in the Walker Museum at Chicago, although some are preserved at Washington. According to the author of the paper before us, Mr. R. S. Bassler, the original determinations were for the most part erroneous. Descriptions of new South American moths, by Mr. W. Schaus, of Twickenham, form the subject of No. 1444 of the same serial.

THE life-history of the North American cave-salamander, *Spelerpes maculicaudus*, by Messrs. A. M. Banta and W. L. McAtee, forms the subject of No. 1443 of the Proceedings of the U.S. National Museum (vol. xxx., p. 67). This handsome salamander appears to be confined to the Mississippi valley, where, although commonly found in caves, it may occasionally be met with in woods. When in caves, it is generally to be found at no great distance from the entrance, usually but little beyond the twilight zone. For breeding purposes, however, these creatures penetrate deeper into the recesses of the caves, where the larvæ are produced; such full-grown larvæ as are met with in the open country having probably been washed out by freshets. Within caves the adult salamanders are usually to be found in crevices or upon rock-shelves.

THE March number of the *Museums Journal* contains an account, by Dr. W. E. Hoyle, of the new zoological institute at Breslau; while Prof. J. T. Wilson's paper on the Australian Museum, Sydney, which was read last year at the Worcester conference, is printed in full. In another article it is stated that Mr. E. Lovett, of Croydon, has formed a large collection of manufactured objects which he is desirous of using as the basis of a "Folk Museum." A schedule is given of the collection of appliances and allied objects used by primitive man, arranged to illustrate the evolution of idea, form, and design, with the amount of superficies required for their proper display in a museum.

IN parts i. and ii. of vol. xxxv. of Gegenbaur's *Morphologisches Jahrbuch*, Prof. B. Hatschek, of Vienna, commences a series of studies on the theory of the primitively segmental structure of the vertebrate skull, dealing in this instance with the anterior extremity of the spinal neural system of the lancelet. Dr. Fleischmann's series of papers on the morphology of the cloaca and related organs in the amniote vertebrates is continued by Messrs. H. Dimpfl and J. Schwarztrauber, who respectively discuss these structures in the guinea-pig and the sheep. In a long paper Mr. G. Ruge brings to a conclusion an elaborate series of studies of the external form of the liver in the Primates, dealing in this instance with the monkeys of the Cercopithecus group. As might have been expected, these display a very generalised character in respect to this organ, which is markedly different from that of the anthropoid group. Among other papers on vertebrate morphology is one by Mr. H. Braus on the question whether the formation of the skeleton is dependent on the muscular layer, and a second, by Prof. G. Jelgersma, on the origin of the vertebrate eye. For the conclusions in both these cases we must refer our readers to the original papers, as they are too long to be given here.

THE authors of a forthcoming monograph upon "Eclipse"—the famous racehorse—ask us to announce that they would be very glad to be informed of any references to this celebrated horse in contemporary literature; to his breeder, the Duke of Cumberland; to his purchaser, Wildman; and to his subsequent owner, Dennis O'Kelly. The monograph will be as completely illustrated as possible from contemporary paintings and engravings and other sources, and will contain detailed photographs of the anatomy of "Eclipse" and the most famous of his descendants, which should prove interesting both to biologists and breeders. It is important that information should reach the authors before June 1 if possible, and all letters, manuscripts, prints, or pictures addressed to "Eclipse," c/o Mr. W. Heinemann, 21 Bedford Street, London, W.C., will be acknowledged before that date, and will be treated with the greatest care.

Mr. Henry S. Wellcome, of Snow Hill Buildings, E.C., is organising an exhibition in connection with the history of medicine, chemistry, pharmacy, and the allied sciences, and has issued a circular indicating the range of the proposed exhibition. The loan of any objects of interest is solicited; these will be insured and carriage paid both ways. The date of the proposed exhibition has not yet been definitely settled.

In the *Comptes rendus* of the Paris Academy of Sciences (April 2, p. 823) M. Lortet gives an account of an examination of the contents of four vases containing the viscera of King Rameses II., the Sesostris of the Greeks, who is believed to have died about 3164 years ago. Profs. Hugounenq, Renaut, and Rigaud were associated with M. Lortet in the examination, and three of the vases were surmised to contain the stomach, intestine, and liver of the great king preserved with soda and aromatic resinous substances, and enclosed in linen bandages. A fourth jar contained the heart of the monarch, hard and horn-like, but on microscopical examination showing the typical bundles of muscle fibres of cardiac muscle, crossing one another.

In the April number of the *Monthly Review*, Mr. Paul Uhlenhuth writes on the blood-relationship of man and apes, and describes how, by means of the precipitin test, various albuminous substances and the blood of different animals may be distinguished from one another. The test has also considerable medico-legal importance, and biologically may be employed to ascertain the relationship of various animals to one another. In this way it may be shown that the anthropoid apes are most nearly akin to man, while the lemurs are but distantly, if at all, related to him.

Some years ago Dr. A. Gallardo advanced a dynamical interpretation of the karyokinetic figures in cell division that was explained in Nature of November 13, 1902, by Prof. M. Hartog. Dr. Gallardo has somewhat modified his former theory, and applying the results obtained from a study of the properties of colloids, he postulates in a paper published in *Annales del Museo Nacional de Buenos Aires*, vol. xiii., a negative charge for the chromatin and a positive charge for the cytoplasm around the poles of the spindle. In proof of his theory the writer reproduces the figures obtained with special apparatus on a metallic plate forming one electrode in an electrolytic solution.

It is remarkable that, despite the numerous investigations during the last ten to twenty years into the coffee-leaf disease caused by species of Hemileia, the complete life-history of the fungus has not been worked out. Mr. G. Massee directs attention to the want of information concerning the æcidial stage in his revision of the genus published in the Kew Bulletin, No. 2, 1906. Four species, two of them recently determined by Mr. Massee, are described, and the probability of the æcidial stage is considered. In addition to an announcement regarding the publication, and a list of the contents of a volume on the "Wild Fauna and Flora of Kew Gardens," a supplementary list of fungi prepared by Mr. Massee is given, among which three species new to science are described and illustrated.

According to the *Pioneer Mail*, the Bombay Government has decided that arrangements should be made for the starting of experiments in the cultivation of rubber plants both in the southern and northern circles, and in the garden of economic botany which is about to be established in Bassein. In the northern circle Mr. Ryan has been requested to prepare and submit, under the direction of the conservator, a scheme for the plantation of the *Ficus elastica,* and for experiments with a view to ascertain the yield of rubber and its commercial value, and to suggest other rubber plants likely to show good results. At the Bassein garden Mr. Gammie has been asked to prepare a scheme of experiments on a smaller scale with numerous rubber-yielding plants with the object of ascertaining which are the most likely to succeed in the coast districts of the Bombay Presidency. For the southern circle orders have been given for the preparation of a scheme for experimental plantation, more particularly of Hevea, in one or more localities under the direction of the conservator.

Mr. O. F. Cook, in an article entitled "The Vital Fabric of Descent," published in the Proceedings of the Washington Academy of Sciences (vii., p. 301), urges that kinesis is the main factor in the evolution of organisms. "Kinesis is not a mysterious force or mechanism to be sought in reproductive cells; it is a general property of organisms, as gravitation is of matter. And of kinesis we know more than of gravitation. Two factors and two results are already obvious. The factors are heterism, or intra-specific diversity, and symbasis, or inter-breeding in a specific network of descent. . . ." "Natural selection neither originates species nor actuates their further development; progressive change would go on whether selection were active or not, and whether the environment were uniform or not. Nevertheless, selection conduces to adaptation, since by permitting changes in some directions and forbidding them in others, it deflects the specific motion. The workings of natural selection are adequately explained only by the kinetic theory."

In the *Zeitschrift* of the Berlin Gesellschaft für Erdkunde (1906, No. 3) appears the first part of an interesting historical paper on the measurement of geographical areas before the invention of the planimeter, by Dr. W. Schmiedeberg.

The new issue (vol. xix., part i.) of *Mitteilungen aus den deutschen Schutzgebieten* contains papers on the daily variation of temperature and pressure at Windhuk, German South-West Africa, and of temperature at Herbertshöhe, Bismarck Archipelago, by Dr. J. Hann. Dr. P. Heidke contributes a paper on the meteorology of German East Africa, dealing with the means for the years 1899 to 1902 from twenty-two stations.

The April number of the *Bollettino* of the Italian Geographical Society contains an extremely interesting paper, by Dr. Roberto Almagia, on the earliest Italian contribution to oceanography. The pamphlet described is the "Relatione del Mare" of Giovanni Botero, published in Rome in the year 1600, and it is remarkable that not only the main division of the subject into statical and dynamical sections, but the subdivisions of each of these into special parts, follow closely the method of treatment adopted in modern research.

We have received a reprint from the *Numismatic Chronicle* of a paper, by Sir John Evans, K.C.B., describing the silver medal or map of Sir Francis Drake, which commemorates the voyage round the world completed in 1580. Three, or at most four, examples of this medal are known, two of which are in the British Museum and one in Sir John Evans's collection. Sir John Evans agrees with Mr. Miller Christy that the silver map and that which is attached to the work of Peter Martyr, "De Orbe Novo" (Paris, 1587), are from the hand of the same engraver, about whom it is only known that the initials of his name were "F. G."

Two reports (Nos. 107 and 108) have been issued by the British Fire Prevention Committee containing particulars of experimental tests of the fire resistance of concrete floors. The two floors were practically identical in design, and were subjected to the same conditions. The results of the tests were, however, very different according to the concrete aggregate used. The one having Thames ballast concrete for the protection of its steel-work failed, whilst the other, with clinker concrete and coke breeze protection to the girders, remained intact. No independent fire tests on such a scale with floor areas measuring 15 feet by 22 feet have been previously carried out.

At the Institution of Civil Engineers an interesting paper on the resistance of iron and steel to reversals of direct stress was read by Dr. T. E. Stanton and Mr. L. Bairstow on April 10. The results of their experiments, which were carried out at the National Physical Laboratory, may be summarised as follows:—The superiority, in resistance to reversals of stress, of moderately high-carbon steels over low-carbon steels and wrought irons, which was discovered by Wöhler to exist when the rate of reversals was 60 per minute, still holds when this rate is increased to 800 per minute, although, according to Reynolds and Smith's experiments, this superiority no longer exists when the rate of reversals is in the neighbourhood of 2000 per minute. So far as comparisons can be made between the results of the authors' experiments and those of Wöhler and Sir Benjamin Baker, there is no marked reduction in resistance due to raising the rate of reversals to 800 per minute. Experiments in which the ratio of tension to compression varied from 1·4 to 0·72 indicated that between these limits the value of the maximum range of stress was practically independent of the actual values of the limiting stresses in tension and compression. The resistance of the materials in three typical cases of rapid reduction of area of the specimens has been determined. The failure of iron specimens due to the development of the slip-lines of Ewing and Rosenhain into cracks has been determined for the case of direct stress, and the failure of moderately high-carbon steel, due to the development of cracks in the ferritic areas of the structure, has also been established.

Messrs. Archibald Constable and Co., Ltd., will publish shortly a work on "Recent Advances in the Physiology of Digestion," by Prof. E. H. Starling, F.R.S.

Sir Martin Conway has written a history of Spitsbergen which the Cambridge University Press will shortly publish under the title of "No Man's Land."

The London Stereoscopic and Photographic Company, Ltd., has issued a new catalogue of photographic apparatus intended primarily for the use of amateurs. The list is attractively produced and conveniently arranged, and copies may be obtained post-free on application.

The Country Press, 19 Ball Street, Kensington, has published a series of twelve picture post-cards of the leaves of British trees and shrubs showing the exact venation in each case. These cards are intended for the use of children and others taking up nature-study; but it is to be hoped that teachers will prefer to direct the attention of their pupils to the actual leaves of plants, and to encourage the children to collect and study natural objects themselves rather than pictorial representations of them, however correct and artistic these may be.

OUR ASTRONOMICAL COLUMN.

Employment of Selenium Cells during Total Solar Eclipse.—During the total eclipse of August last, the observers at Tortosa made use of selenium cells for the double purpose of determining the variation in sunlight during the progress of the eclipse, and of ascertaining the exact moments of the beginning and end of totality.

As is generally known, the electrical conductivity of selenium increases on exposure to sunlight, being especially sensitive to the less refrangible end of the spectrum; therefore, by placing the cell in series with a battery and a delicate reflecting galvanometer, the amount of light falling on the selenium may be registered by registering the movements of the galvanometer beam of light.

Whilst the decrease of light, during an eclipse, is not *visible* until the eclipse is well advanced, the galvanometer needle at Tortosa was seen to move immediately after first contact, and for nearly an hour showed a uniformly increasing resistance.

Assuming that the light during totality was of the same quality as that obtaining at dawn, the results derived from the observations show that its brightness was about equal to that of the sky some thirty or forty-five minutes before sunrise.

The results obtained regarding the instants at which totality began and ended were very satisfactory, and it is suggested that, by placing similar equipments along the line of totality during future eclipses, far better results could be obtained than by the visual observations hitherto depended upon (*Astrophysical Journal*, No. 2, vol. xxiii.).

Catalogue of Pleiades Stars.—We have received from Dr. R. S. Dugan, of the Princeton (N.J.) Observatory, a copy of the inaugural dissertation presented by him for the doctorate of the Heidelberg University.

This publication contains the magnitudes and mean places (for 1900·0) of 359 stars of the Pleiades group. In addition to the catalogue, Dr. Dugan discusses the methods employed in measuring the plates and reducing the data thereby obtained. A chart of the group, on which the catalogue number of each star is shown, also accompanies the dissertation.

The Total Solar Eclipse of the Sun of January, 1907.—Among the numerous important papers communicated to the meeting of the Astronomical and Astrophysical Society of America, held at New York on December 28–30, 1905, there is one by Prof. David Todd which will probably be found to be of special interest to eclipse observers.

Prof. Todd and Mr. Baker have computed the essential data for ten possible stations, and have discussed the latter and the means of getting to them. It appears that the new railway across Russian territory will afford the greatest facilities for reaching the Turkestan stations, whilst observations will also be possible some 600 miles north-west of Peking. The complete discussion is to be published in the *American Journal of Science* (*Science*, No. 586, vol. xxiii., N.S.).

Observations of Nebulæ.—Since the year 1884 M. Bigourdan, of the Paris Observatory, has been assiduously employed in making a complete survey of nebulæ.

The results of this survey are to be published in five volumes, of which two (iv. and v.), dealing with the nebulæ situated between 14h. and 24h., have already appeared.

At the meeting of the Paris Academy of Sciences held on March 19, M. Bigourdan presented the second part of